# What to do in case of a Radiological Emergency

#### at Columbia Generating Station or Department of Energy Facilities at Hanford

1 Listen to the emergency instructions carefully and keep your radio tuned to the primary Emergency Alert System (EAS) radio station KONA 610 AM or 105.3 FM.

Remember, notification of an emergency does not always mean you should evacuate. You may not need to take any actions.

2 Alert your neighbors and employees (by means other than telephone) and make sure they understand the emergency instructions.

#### 3 If asked to shelter:

- Remain in your home.
- Close all doors and windows.

- Turn off range fans and clothes dryers.
- Use phone only for a personal emergency.
- ♦ Keep pets inside.
- If you must go outside, cover your nose and mouth with a wet cloth.
- Listen to primary Emergency Alert System (EAS) radio station KONA 610 AM or 105.3 FM for further instructions.
- ◆ Start planning for possible evacuation.
- Close anything that might bring air in from the outside, such as a fireplace damper, range fan, bathroom vent, or clothes dryer.
- If you are in a car, keep the windows and vents closed. Continue to your destination.

#### 4 If asked to evacuate:

Listen to instructions carefully. Be sure your section is being evacuated before you follow the next steps. You live in section \_\_\_\_\_\_ Refer to page 11.

Fill in your section from the map on page 11. Residents in Benton, Franklin, and Grant Counties may check the sticker on their emergency radio to find out which section they are in.

- ◆ Take items such as medicines, clothing, baby food, blankets, pillows, sanitary supplies, checkbook, credit cards, portable radio, and this emergency calendar.
- Turn off stoves and space heaters.
- If there is time, shelter animals and leave stored feed and water.
- Lock your doors and windows.

- Take your own car if possible.
   Take neighbors if they need a ride.
   If you don't have a car, ask your neighbor for a ride.
- If your children are attending a daycare or school at Edwin Markham, Country Haven Academy, Country Christian Center, or Big River Country School, they will be bused to Columbia Basin College, 2600 North 20th, Pasco. Listen to KONA to learn what actions officials are taking at each school. Schools and daycare centers near an area affected by an emergency may choose to evacuate.
- When you leave, drive away from the Hanford nuclear facility as shown on the map. Once out of the Emergency Zone, go to the nearest open Assistance Center. Your County Official will provide instructions on KONA 610 AM or 105.3 FM radio.
- Stay tuned to your radio, drive carefully, and remain calm.
- Register at the Assistance Center, so friends and relatives can locate you easily.



If you must go outside, cover your nose and mouth with a wet cloth.

### Nuclear Facilities on the Hanford Site

Hanford Site and Energy Northwest Facilities

#### **Columbia Generating Station**

Energy Northwest's Columbia Generating Station is a commercial nuclear power plant that has produced electricity since May 1984.



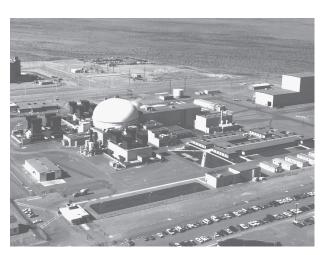
#### 100 Area

Spent nuclear fuel is stored primarily in water basins at the K East and K West Reactor Sites pending final disposal decisions.



#### **FFTF**

The Fast Flux Test Facility is a former DOE research reactor that is currently not operating and will be closed permanently.



#### 200 Area

Radioactive waste and chemicals used in the processing of reactor fuel for defense production are stored at several locations on the Hanford site, most in the 200 Area. Treatment facilities will transform high-level and low-level waste into a stable form for long-term storage and ultimate disposal.

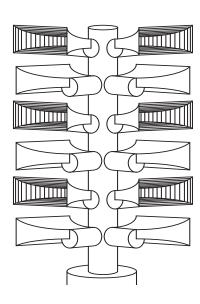


#### 300 Area

The primary activities in the 300 Area are research and development and the clean up of deactivated facilities.



## How would I be told about an emergency?



◆ If there is a problem on the Hanford Site, persons using the Columbia River will hear sirens sound continuously for three minutes, followed by an audible message. These sirens are a signal to evacuate the river and tune to the Emergency Alert System Radio Station KONA 610 AM or 105.3 FM for more information. Other radio and TV stations may also broadcast emergency information.

- ◆ For any radiological emergency on the Hanford Site, personnel and boats provided by the U.S. Coast Guard, and the Counties Sheriffs' Departments may also warn people to evacuate the river. If there has been no radiological release, boaters will be advised to return to their launch points. If there has been a radiological release, boaters will be instructed to proceed to a monitoring station. Boaters would then receive further instructions from County Officials.
- ◆ Additional notification will be made by Coast Guard broadcast of a "Notice to Mariners" over Marine Band Channel 16. The notice and emergency instructions then will be broadcast over Channel 22 every 15 minutes.
- Residents within the Emergency Planning Zone in Benton, Franklin, and Grant Counties have emergency alert radios. These radios would be turned on automatically by a signal transmitted just before an Emergency Alert System message is broadcast.
- ◆ Persons within the Emergency Planning Zone using the Richland Off-Road Vehicle Park, the Horn Rapids Park, the Rattlesnake Mountain Shooting Facility, the Wahluke Hunting Area, or the Ringold Fishing Area would be notified by sirens sounding continuously for three minutes, followed by an audible message. They would be told to evacuate the area and tune their radios to KONA 610 AM or 105.3 FM for more information.

## What actions would I be asked to take?

- You may be asked to prepare to shelter or evacuate, or
- You may be asked to shelter or evacuate immediately, or
- You may be told that no actions are necessary.

Remember: Notification of an emergency at Columbia Generating Station or a Department of Energy nuclear facility does not always mean you should evacuate. Follow your County Official's instructions. You may not need to do anything.

For more information now, contact: Benton County Emergency Management— (509) 628-2600 or 1-800-841-7953

Franklin County Emergency Management– (509) 545-3546 or 1-800-258-5873

Grant County Department of Emergency Management– (509) 762-1462 or 1-888-431-9911

## **Emergency Checklist**

#### **Preparing for an emergency**

In the event an emergency occurs and a family is asked to leave home temporarily, there may not be much time to assemble items necessary for immediate family needs. You will be better prepared if you gather a "kit" containing at least some of these items ahead of time. Then keep your emergency supplies in a specified place known to all family members.

## Other things you can do to help prepare for an emergency include:

- Keeping at least one vehicle in good running order.
- Keeping important papers in a safe place.
- If you have special needs in an emergency, please call your County Emergency Management Office.

#### **Medical Items**

- Medicine(s)
- ☐ Eye glasses or contacts
- Dentures
- Special diet foods
- Medical alert data for members with special concerns

#### **Baby Supplies**

- Baby food
- Baby formula
- Diapers/baby wipes
- ☐ Favorite toy

#### **Extra Clothing**

- ☐ Enough for 3 days away from home
- Shoes

#### **Personal Hygiene Items**

- Shaving items
- Special soaps
- Sanitary items
- Towels
- ☐ Toothpaste and toothbrushes

#### Money

- ☐ Cash
- Checkbook
- Credit cards

#### **Identification and Important Papers**

Driver's license

#### **Bedding**

☐ Sleeping bags or two blankets per person

#### **Miscellaneous**

- Portable radio with spare batteries
- ☐ Tool kit
- ☐ This emergency calendar
- ☐ Flashlight with extra batteries
- List of relatives with addresses and telephone numbers

#### Other emergency items

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You will be better prepared if you gather a "kit" containing at least some of these items ahead of time.

#### **Evacuation**

## What should I do if I'm told to evacuate?

- Listen to instructions carefully to be sure you live in the section being evacuated.
- If you do live in the section being evacuated, refer to page 11, leave your home within 30 minutes unless you are told there is more time for animal care or other preparation.
- Keep phones free for emergency use.
- Talk to your neighbors (by means other than the telephone) to ensure they have also heard and understand the emergency notification instructions.
- Notify your temporary or permanent farm help or neighboring farmers who may be working out-of-doors and may not have received the message.
- Take with you the emergency supplies listed on page 4 of this calendar. You should plan to be away from home for at least 72 hours.
- When you leave, drive away from the Hanford nuclear site as shown on the map. Once out of the Emergency Zone, go to the nearest open Assistance Center. Your County Official will provide instructions on KONA 610 AM or 105.3 FM radio.

- ◆ Local officials will give special consideration for the protection of school children. Children attending Franklin County schools inside the area will be bused to Columbia Basin College in Pasco. Your children will be cared for there until you arrive.
- Before leaving, do the following:
  - 1. Turn off stoves and space heaters.
  - 2. Leave food and water for pets you are not taking with you. (The Assistance Centers will not be able to accommodate pets, except for seeing-eye and hearing dogs.)
  - 3. Lock all doors and windows.
- While driving, keep your windows and vents closed and obey traffic signals. There is no need to rush.

#### Important!

Children who are attending Edwin Markham Elementary, Country Haven Academy, Big River Country School, or Country Christian Center will be taken care of by school officials. Do not go to these schools to pick up children. That action could delay their move to a safer place. See page 6 for more information on emergency procedures for school children.

- Register at the Assistance Center when you arrive to help officials make sure everyone has evacuated. This also will help the Red Cross provide information to inquiring relatives.
- After you register, you may go to a friend or relative's home, or the Red Cross will provide for your food, lodging, and first aid needs.
- If it is necessary that you visit your home briefly, or if farmers need to care for livestock, check with the Assistance Center office to make proper arrangements. In order to do this, you would fill out a reentry request that will be reviewed by County Officials and arrangements made as soon as possible.
- You will be told as soon as it is safe to return home.



Turn off stoves and space heaters

## What services would be provided at the Assistance Center?

- In an emergency in which there may be a risk of radioactive contamination, evacuees will be checked for contamination at the Assistance Centers and, if necessary, a means of decontamination will be provided.
- The American Red Cross will maintain a registration file on families who report to the center so information can be provided to concerned relatives and friends.
- Lodging will be made available.
- Beverages and snacks or sandwiches will be provided as soon as possible, once evacuees start arriving at the center. A special effort will be made to provide for the dietary needs of infants, diabetics, etc.
- First-aid care will be available.
- Social services and organized activities for children and adults will be provided.

## How will my home be protected while I'm gone?

 Law officers will not allow unauthorized persons past roadblocks to enter the evacuated area.

## What emergency plans have been made for my children at school?

- ◆ In some cases, schools may be evacuated before it is necessary for the general public to evacuate. Children at Edwin Markham Elementary, Country Haven Academy, Country Christian Center, or Big River Country School will be bused to Columbia Basin College at 2600 North 20th, Pasco. Parents may pick their children up at the regular dismissal time. The children will be cared for at Columbia Basin College until their parents pick them up.
- Schools and daycare centers near an area affected by an emergency may choose to evacuate in an emergency. Parents should talk to their school officials about their emergency plans.
- Children who live in an emergency zone but go to school outside of that zone will stay at their schools. Parents may pick them up at the school.
- Special care will be taken to protect school children. If you have questions, please contact your child's school today.
- Local officials will give special consideration for the protection of school children.

#### What if I need transportation?

- ◆ Call a neighbor for help.
- If you cannot reach your neighbor, contact your County Emergency Management Officials to request assistance.
- ◆ Stay indoors while you wait for help and follow sheltering instructions on page 7.

## Can I call now to ask for special help or transportation?

- Yes. Don't wait for an emergency to ask for help. Telephone your County Emergency Office today if you are elderly, handicapped, or without a car. Your County Emergency Management Director will put you on a list that shows who needs special help during an evacuation.
- Benton County residents, call (509) 628-2600 or 1-800-841-7953
- Franklin County residents, call (509) 545-3546 or 1-800-258-5873
- Grant County residents, call (509) 762-1462 or 1-888-431-9911



#### **Sheltering**

#### For Your Animals

- ◆ If you are in a car with your animals, keep the windows and vents closed. Continue to your destination.
- Start planning for possible evacuation. If you are told there is adequate time, consider taking the following actions to protect your farm animals

- Move farm animals into a barn or shed, if available.
- Leave them stored feed and water, if possible.
- ~ Give dairy animals first consideration for shelter, stored feed and water to minimize possible contamination of their milk.
- More detailed information on protecting farm animals and products from radiation is available from your County Emergency Management Office.

#### For You

- Go into a house or other well-built structure.
   Close all windows and outside doors. If no shelter is available, evacuate.
- Tune your radio to the primary EAS station KONA 610 AM or 105.3 FM for further instructions.
- Keep everyone inside including pets.
- Notify your employees or neighbors who may not have gotten the message.
- ◆ Keep phone lines free for emergency use.

## Protective Action Guides for a Nuclear Facility Accident

In the event of an accident on the Hanford Site, radioactivity might be released to the environment. This radioactivity may be in the form of chemically inert gases, gaseous radioactive iodine, or small particles of other radioactive elements. The principle means by which the public may be exposed to radiation following an accident are:

- Externally from radioactive materials that are released into the air.
- Internally from breathing airborne radioactive particles or eating food contaminated by radioactive elements.

The Federal government has set protective action guidelines for radiation exposure to the public from nuclear facility accidents. These guidelines recommend actions to be taken to protect the public when (1) the total projected dose to the whole body from external radiation exceeds 1,000 millirem or (2) the total projected dose to the thyroid from internal radiation exceeds 5,000 millirem. In addition, precautionary protective actions may be recommended at radiation levels below the above limits or based on facility conditions before any radioactivity is released from a facility.



Am I exposed to radiation living near a nuclear facility?

Your annual radiation exposure living near a nuclear facility is about the same as from watching color television for a year (1 mrem).

# Columbia Generating Station and Department of Energy Emergency Classifications

What kinds of emergencies could happen?

Few events at nuclear facilities are actual emergencies. If one were to occur, the facility operators, based on predetermined guidelines, would decide how serious it was.

## There are four levels of emergencies:

#### **1 Unusual Event**

The least serious emergency. It means there is a minor problem at the facility being handled by facility workers. Because of strict federal rules, such events are reported to local, state, and federal officials. Unusual events do not involve a release of radiation.

#### 2 Alert

An event that could affect facility safety. County, state, and federal officials will activate emergency centers and monitor the situation.

#### **3 Site Area Emergency**

An event that could effect the safety of the public near the facility. Public Officials will tell you what actions, if any, you should take.

#### 4 General Emergency

The most serious. Local officials will tell people in affected areas what actions to take for their safety.

## Areas that may be evacuated

- The Columbia River within the emergency zone
- ◆ The Wahluke Hunting Area
- The Ringold Fishing Area
- The Rattlesnake Mountain Shooting Facility
- The Horn Rapids Park in Benton County
- ◆ The Off-Road Vehicle (ORV)
  Park in Richland
- Sirens in these areas would activate, followed by an audible message instructing recreationists about what actions to take.

Refer to page 5 for further evacuation instructions.

#### **Radiation**

## Understanding radiation and radioactivity

Radiation is energy in the form of small particles or rays that are emitted from a source. The source may be a machine that produces radiation, such as a dental x-ray machine, or it may be an unstable atom that, because of its instability, emits radiation. Unstable atoms that emit radiation are referred to as being radioactive.

## Radiation in our environment

Radioactive materials and radiation occur naturally and have always been part of the environment. For example, the earth's crust contains uranium, radium, thorium, and other radioactive materials. Cosmic radiation from outer space and from the sun penetrates the earth's atmosphere and continuously bombards our planet. The elements hydrogen, potassium, and carbon are examples of materials that contain both radioactive and nonradioactive atoms. These naturally occurring radioactive elements are in the air we breathe, the food we eat, and the water we drink. As a result, every person has radioactive materials in his or her body.

Fallout from atmospheric tests of nuclear weapons is a source of additional radioactive materials in our environment.

Low levels of these materials, which include plutonium, radioactive cesium and strontium, are found in the air, soil, and water.

## Health effects of radiation exposure

As radiation travels through matter, it gives up some or all of its energy. Food heated by microwaves is an example of that process. In the human body, radiation can cause chemical changes that may damage or kill cells if the amount of energy absorbed is large enough. This is the principle behind radiation therapy to treat cancer.

The amount of radiation energy absorbed in a person's body is measured in terms of radiation dose. One unit used to measure this dose is called a millirem. Many dose standards are stated in terms of rem, which is equal to 1,000 millirem.

Exposure to radiation may cause biological effects that may be harmful. Whether effects occur depends on two factors: How much radiation dose is received and whether the dose was received over a short or long time period. For example, radiation doses of about 25,000 millirem to the whole body received in a few hours may cause slight temporary changes in a person's blood. However, the same radiation doses received over a long period of time, such as years, may cause no measurable changes.

Exposure to radiation may also increase a person's risk of developing cancer. The normal risk of dying from cancer in a person's lifetime is about 16 percent (or about 1 in 6). The National Academy of Sciences Committee on the Biological Effects of Ionizing Radiation stated in 1980 that a single dose of 1,000 millirem may increase the risk of dying from cancer by 0.02 percent (from a total of 16 to 16.02 percent).

Source Millirem	per	year
Natural sources: Cosmic radiation, terrestrial, in the body, etc. U.S. average	65	1)

## Average expected radiation doses

All members of the public are routinely exposed to sources of ionizing radiation. These sources are of two general types: Those of natural origin, and man-made sources.

Natural sources include cosmic radiation, natural radioactive materials in the ground, radiation from radionuclides naturally present in the human body, and radon exposure due to living indoors. Man-made sources include medical x-rays, smoke detectors, and fallout from atmospheric testing of nuclear weapons.

The above table shows examples of approximate radiation doses from these sources.

#### Am I exposed to radiation living near a nuclear plant?

We are all exposed to natural and man-made radiation. On average, a person is exposed to less than 0.1 millirem of radiation per year from nuclear energy. That compares with 1 millirem of radiation from watching television, 7 millirem per year from building materials like brick and concrete, 40 millirem from a chest x-ray, 40 millirem from food and water, and 27 millirem from cosmic rays.

#### How Your Emergency Alert System Works

## To set up an "E-Alert" FM radio (KONA 105.3)

- Plug cord into AC wall outlet.
- "On" light should be lit.
- The button switches radio between "on" and "standby."
- With the radio in "standby," you will hear a tone that will precede broadcast of an emergency message. The signal will automatically activate your radio.
- If you are listening to your radio when an emergency message is broadcast, you will hear the tone and message interrupting regular programming.
- When the tone comes on, listen to the message and then press and release the button to reset the radio.

## Emergency alert radio instructions

- Your emergency radio is your first alert of a problem at one of the Hanford site or Energy Northwest nuclear facilities.
- Put the radio in an adult's bedroom, close to the bed and out in the open. Do not put it under furniture or inside a cabinet.
- Keep the radio plugged in. It's battery is meant only as a backup during a short power outage.
- KONA Radio tests the Emergency Alert System during daylight hours on a periodic basis

## Call your emergency office today:

- ◆ If your radio does not turn on each month
- If it turns on at night for no reason
- If the battery appears to be dead
- ◆ If you don't have a radio.

In Benton County, call (509) 628-2600 or 1-800-841-7953

In Franklin County, call (509) 545-3546 or 1-800-258-5873

In Grant County, call (509) 762-1462 or 1-888-431-9911

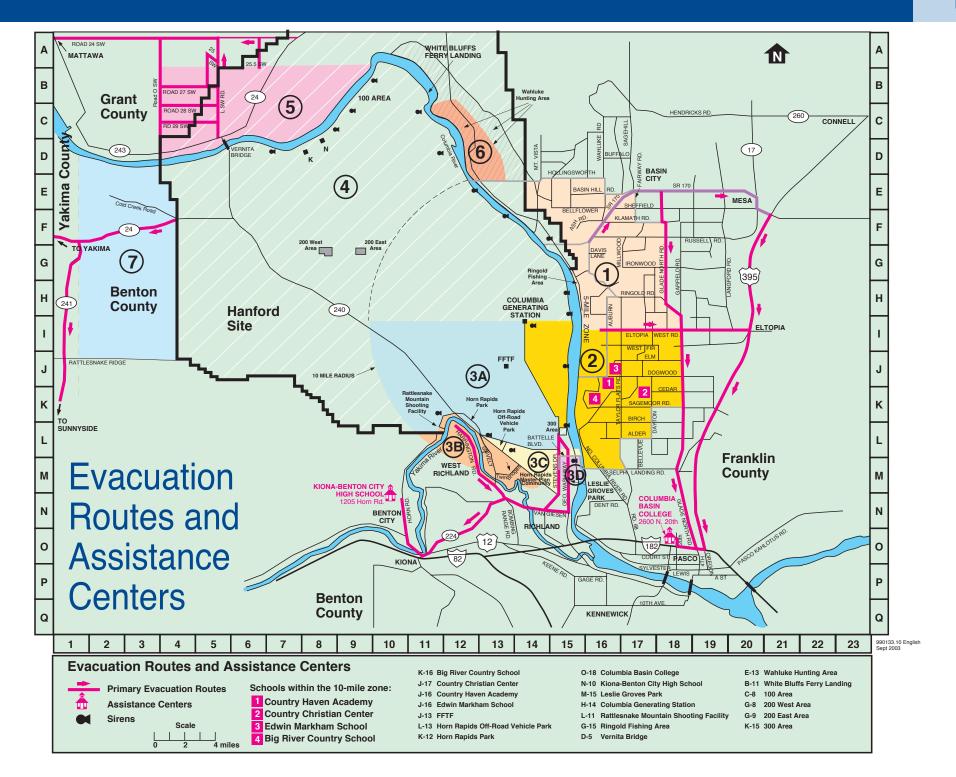


#### **Important!**

Test battery every six months by unplugging radio. PLUG BACK IN after confirming operation for approximately two minutes.



Keep the radio in an adult's bedroom, close to the bed and out in the open.



#### Which Roads should I take?

Section	Section Description	Evacuation Route and Assistance Center	
1	Includes the following areas: (1) north of Eltopia West Rd., west of Glade North Rd., south of West Klamath Rd., and east of the Columbia River; (2) north of West Klamath Rd., west of Fair Way Rd., south of Basin Hill Rd., and east of the Columbia River; (3) north of Basin Hill Rd., west of Wahluke Rd., south of Hollingsworth Rd., and east of the Columbia River. A portion of section 1 extends west of the Columbia River to Columbia Generating Station but there are no permanent residents in this area.	Primary Evacuation Route: Russell Rd. east then south to Pasco. Alternates: SR 170 through Basin City leading to Russell Road, then east and south to Pasco; Ironwood Rd. east to Langford Rd. and south to Eltopia, east to Highway 395 and south to Pasco; Hollingsworth Rd. to Wahluke Rd. to Buffalo Rd. to Sagehill Rd., south on SR 170, east through Basin City to Mesa, south on Highway 395 to Pasco.	Assistance Center Columbia Basin College, 2600 North 20th, Pasco (509) 547-0511
2	Includes the following areas: (1) north of West Sagemoor Rd., west of Glade North Rd., south of Eltopia West Rd., and east of the Columbia River; (2) north of Alder Rd., west of Dayton Rd., south of West Sagemoor Rd., and east of the Columbia River; (3) north of Selph Landing Rd., west of Taylor Flats Rd., south of Alder Rd., and east of the Columbia River. A portion of section 2 extends west of the Columbia River to Columbia Generating Station but there are no permanent residents in this area.	Primary Evacuation Route: Eltopia West Rd. east to US 395, then south to Pasco; or Glade North Rd. south to Pasco.  Alternates: Taylor Flats Rd. south to Pasco.	Assistance Center Columbia Basin College, 2600 North 20th, Pasco (509) 547-0511
<b>3a</b>	This area is entirely on the Hanford Site and is Southwest of the Columbia Generating Station.	4S to Stevens Drive, then West on Van Giesen (SR 224) to Benton City, then North on Horn Drive (SR 225) to the Kiona-Benton City High School.	Assistance Center
3b	This area is South of SR 240, West of River Park Street and North of West Richland and east of SR 225. It includes the Horn Rapids Master Planned Community and those homes and businesses that are accessed from Harrington Road, Yakima River Drive, Snively Road, Twin Bridges Road and Weidle Road. It also includes the Rattlesnake Mountain Shooting Facility and the Horn Rapids Park.	South on Twin Bridges to Harrington Road, then South on Harrington Road to Grosscup Road, then South on Grosscup Road to Van Giesen (SR 224), then West on Van Geisen (SR 224) to Benton City, then North on Horn Drive (SR 225) to the Kiona-Benton City High School.  South on Harrington Road to Grosscup Road, then South on Grosscup Road to Van Giesen (SR 224), then West on Van Geisen (SR 224) to Benton City, then North on Horn Drive (SR225) to the Kiona-Benton City High School.  Southeast on SR 240, then South on SR 240 to Van Giesen (SR 224),	High School, 1205 Horn Drive, Benton City (509) 588-3310
		then West on Van Giesen (SR 224) to Benton City, then North on Horn Drive (SR 225) to the Kiona-Benton City High School.	
3c	This area is South of the Hanford Site, and North of Battelle Boulevard, between Stevens Drive and the Columbia River. It also includes the area West of Stevens Drive between SR 240 and the Hanford Site. It includes the Horn Rapids Off-road Vehicle Park and the Richland Landfill. It does not include businesses accessed from Logston Boulevard, Sullivan Boulevard and Robertson Drive.	Southeast on SR 240, then South on SR 240 to Van Giesen (SR 224), then West on Van Giesen (SR 224) to Benton City, then North on Horn Drive (SR 225) to the Kiona-Benton City High School.  South on Twin Bridges to Harrington Road, then South on Harrington Road to Grosscup Road, then South on Grosscup Road to Van Giesen (SR 224), then West on Van Geisen (SR 224) to Benton City, then North on Horn Drive (SR 225) to the Kiona-Benton City High School.	
3d	This area is North of First Street and South of Battelle Boulevard, between Stevens Drive and the Columbia River.	South on Stevens Drive to SR 240, then South on SR 240 to Van Giesen, then West on Van Giesen (SR 224) to Benton City, then North on Horn Drive (SR 225) to the Kiona-Benton City High School.  South on George Washington Way to Van Giesen, then West on Van Giesen (SR 224) to Benton City, then North on Horn Drive (SR 225) to the Kiona-Benton City High School.	
4	This section is on the Hanford Site and under jurisdiction of the Department of Energy. There are no permanent residents in this area. Hanford workers would be notified if any protective actions were necessary.		
5	This section is bordered by Grant County Road or section line 25.5 SW on the North. The west border is Road "O" SW. The eastern and southern border is created by the Columbia River. The East portion of this section is set aside for wildlife and there are no permanent residents. (East of State Route 24). The western portion is irrigable ground with farming and orchard operations. Residential and seasonal laborers reside in these areas.	Primary Evacuation Route: North on County Road "O" SW or "L" SW, then west on County Road 24 SW towards Mattawa.	
6	This section includes a section of the Wahluke Hunting Area.		
7	This section is located between the western Hanford Site boundary and the Yakima/Benton County line. It is bordered on the North by the Columbia River and on the South by the top of Rattlesnake Ridge.	Primary Evacuation Route: West on SR 24 towards Yakima/Moxee Area of west on SR 24 to SR 241 then south to Sunnyside.	or